

FIG. 1A

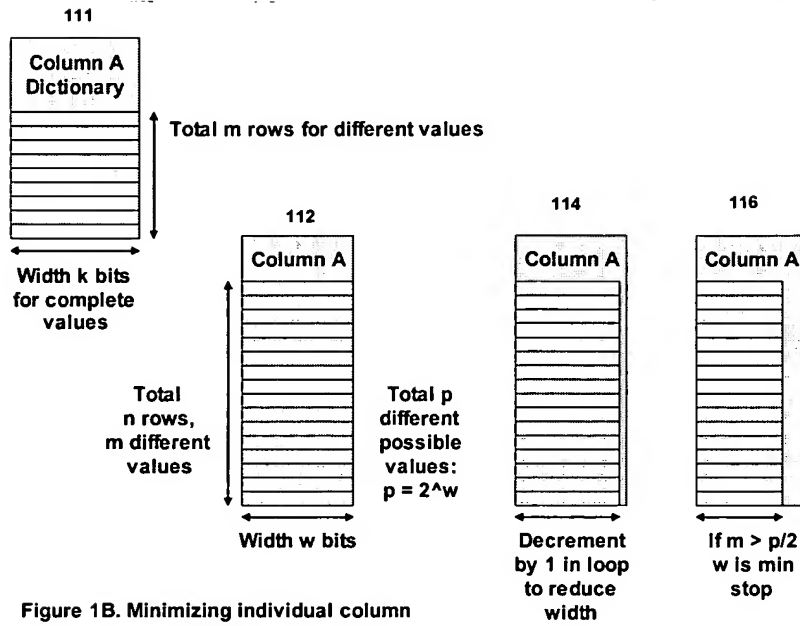
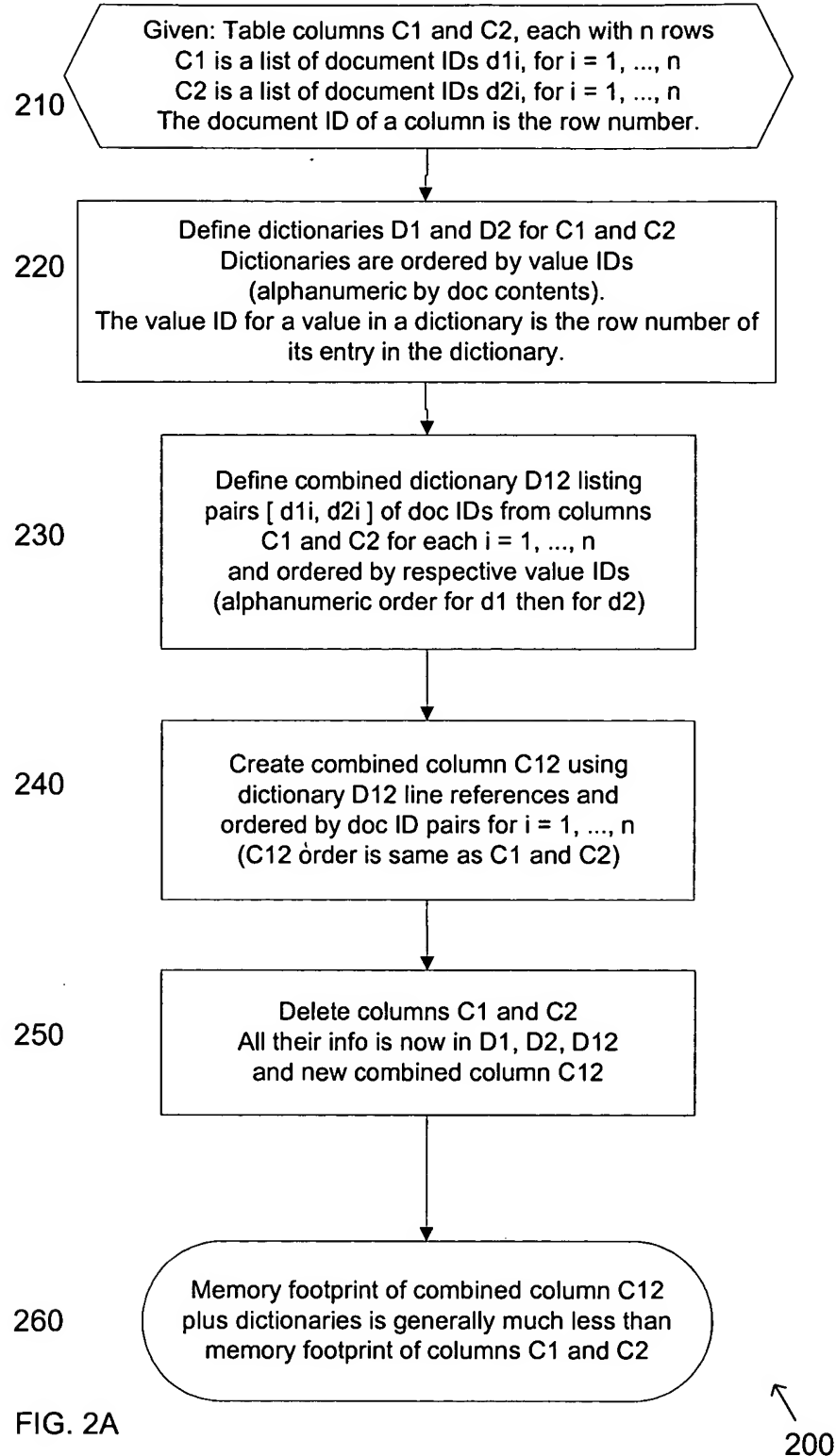


Figure 1B. Minimizing individual column width



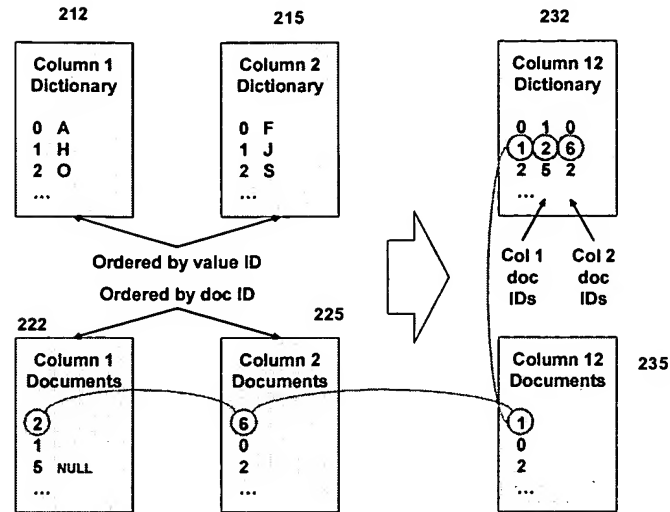


Figure 2B. Combining columns to save space

<b>Memory required (bits)</b> 310	<b>Column</b> 320	<b>Dictionary</b> 330
Original 1 335	$n * w_1$	$m_1 * k_1$
Original 2 340	$n * w_2$	$m_2 * k_2$
Combined 12 (worst case) 345	$n * (w_1 + w_2)$	$m_1 * m_2 * (w_1 + w_2)$
Combined 12 (best case) 350	$n * w_m$	$m_m * (w_1 + w_2)$

<b>Key</b> 301	
n	Number of rows in original columns (and in original table)
$w_j$	Width of column j in bits (minimized as in method 100, Fig. 1A)
$m_j$	Cardinality of column j (i.e., number of different values in column j)
$k_j$	Width of widest value in column j in bits (typically, $k_j > w_j$ )
$m_m$	Maximum of $m_1$ and $m_2$ (i.e., larger of the two values)
$w_m$	Maximum of $w_1$ and $w_2$ (i.e., larger of the two values)

**FIG. 3**